DOCUMENT RESUME

ED 361 486 CE 064 391

TITLE	Vocational + Academic Integration: Preparing Texas Students for the Work Force. Evaluation Report.
INSTITUTION	Texas State Council on Vocational Education, Austin.
PUB DATE	93
NOTE	53p.
PUB TYPE	Reports - Evaluative/Feasibility (142) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Academic Education; Administrator Attitudes; Educational Legislation; *Educational Policy; *Educational Practices; Federal Legislation; High Schools; *Integrated Curriculum; Outcomes of Education; Policy Formation; Position Papers; Public Policy; Questionnaires; *School Districts; State Surveys; Statewide Planning; *Vocational Education
IDENTIFIERS	Carl D Perkins Voc and Appl Techn Educ Act 1990; Elementary Secondary Education Act; *Texas

ABSTRACT

In a study of integration of vocational and academic education in Texas, administrators of a stratified random sample of 112 school districts in the state were surveyed, and 65% responded. Steps toward integration were being taken in 84% of the districts; however, only four districts have implemented integration plans described as comprehensive. Health occupations, trade and industrial, and English courses were the most likely to be integrated. Vocational students at integration sites were found to have closed the achievement gap with college prep students by 89% in reading, 36% in math, and 75% in science. Insufficient release and preparation time for teachers was identified as the main obstacle to integration. Perkins funds for integration were spent most frequently on staff development, computer and software purchases, and additional career counselors and guidance activities. Ten recommendations for increasing integration of vocational and academic education were formulated. (Appended are the following: the administrator survey, a list of integration pilot sites, and a position statement of the Florida, New York, and Texas state councils on vocational education in reference to incorporating integration of vocational and academic education into the Elementary and Secondary Education Act.) (MN)

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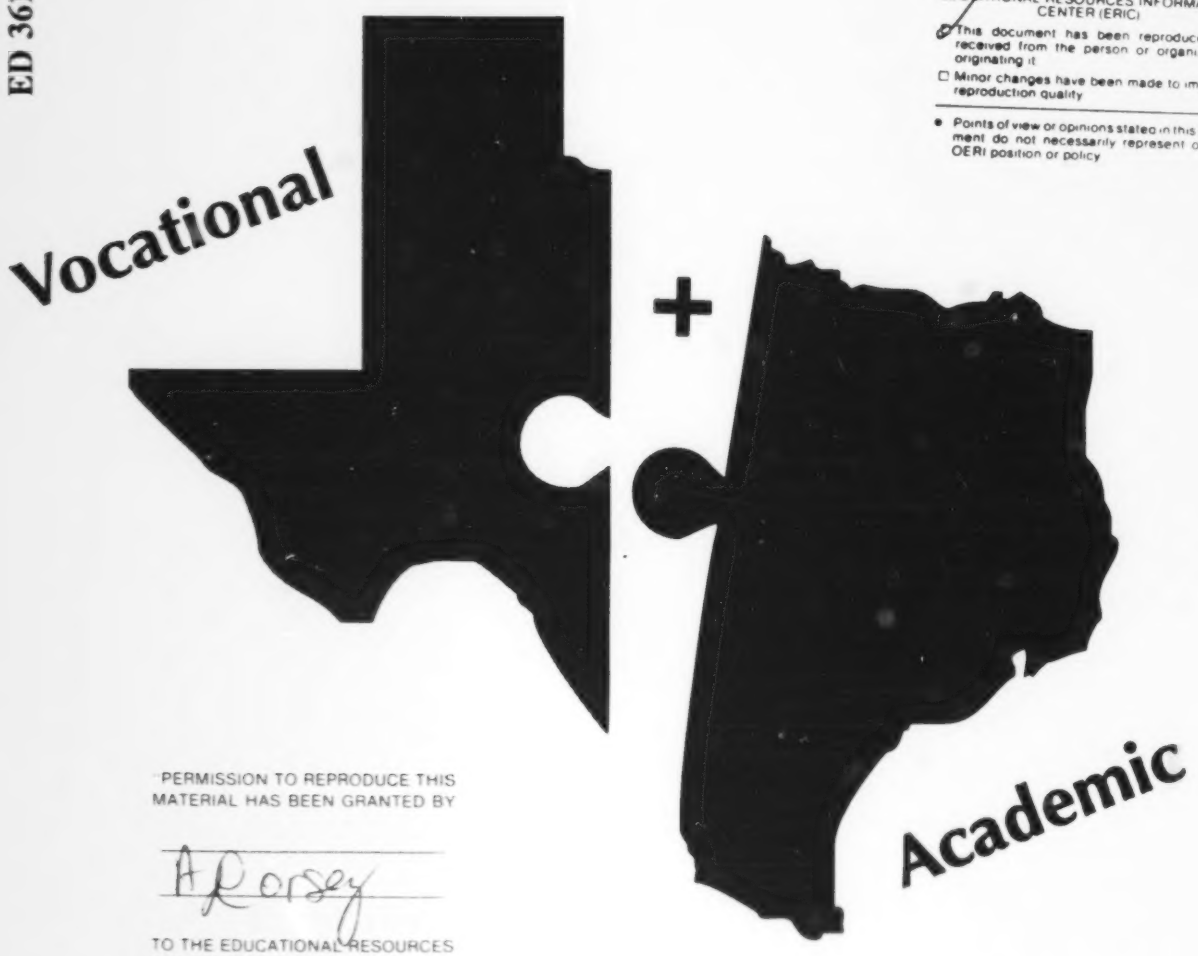

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Integration: Preparing Texas Students for the Work Force

CE 064 351

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Ann Hodge
Houston
Representing the Private Sector
Chair

Mike Bickley
Lufkin
Representing Labor

Sylvia Talavera Blain
Odessa
Representing Postsecondary Education

Shirlene S. Cook
Beaumount
Representing Secondary Education

Paul Ellis
Austin
Representing the Private Sector

Edna I. Garza-Escobedo, Ph.D.
Harlingen
Representing Postsecondary Education

Martha Hinojosa-Nadler
Austin
Representing the Private Sector

Agency Mission

The Texas Council on Vocational Education will provide proactive leadership to define the role of vocational education, and advise state and federal policymakers on ways to strengthen and reform vocational-technical education, as well as build a climate for the acceptance of outstanding vocational-technical education programs, in order to make all Texans more competitive and productive in the world economy.

Agency Philosophy

The Council's recommendations and issue papers will infuse the views of business, industry, agriculture, labor, learning institutions and the general public into the policymaking process.

The Council's evaluation and assessment of vocational-technical education and training programs will be based on the needs of students, employers, and taxpayers.

The Council will provide and encourage a climate of cooperation and coordination among vocational-technical education and job training stakeholders.

The Council will be open and responsive to policymakers, agency personnel and citizens in regard to the questions and concerns about vocational education.

The Council will approach their responsibilities with a deep sense of commitment and caring about all citizen's of Texas and the economic welfare of the state.

Theodore A. Talbot
Waco
Representing the Private Sector
Vice Chair

Steve McSpadden
Quanah
Representing Agriculture

Jack C. Pennington
Garland
Representing Labor

Raul Ramirez, Ph.D.
El Paso
Representing Postsecondary Education

Henry R. Sollers
Cotulla
Representing Secondary Education

Lillian J. Suchoff
Corpus Christi
Representing Secondary Education-Special Populations

Staff:
Lynda S. Rife
Robert L. Williams
Valeria Blaschke
Anne M. Dorsey
Michael Gutiérrez

E V A L U A T I O N

Table of Contents

R E P O R T

Agency Mission and Philosophy ..... Inside Cover

Executive Summary ..... Page i

Introduction ..... Page 1

- Divided Educational System ..... Page 1
- Purpose of Report and Methodology ..... Page 2
- Benefits of Integrating Academic and Vocational Education ..... Page 2
- Defining Integration ..... Page 4

Integration Efforts in Texas ..... Page 8

- Integration: A Dynamic Process ..... Page 8
- Extent of Integration ..... Page 8
- Teacher Involvement ..... Page 10
- Courses Targeted ..... Page 11
- Students Targeted ..... Page 12
- Use of Perkins Funds by Districts ..... Page 13

Impact on Student Gains ..... Page 15

- Outcome Measures ..... Page 15
- Integration Objectives in Texas Schools ..... Page 15
- Initial Pilot Site Evaluation ..... Page 16
- Preliminary Impact Data ..... Page 16

Integration Sites ..... Page 22

Barriers and State Initiatives ..... Page 25

- Obstacles to Integration ..... Page 25
- Use of Perkins Funds for State Leadership ..... Page 26

Recommendations ..... Page 29

Endnotes ..... Page 35

Appendices ..... Page 36

E V A L U A T I O N

Executive Summary

R E P O R T

INTEGRATION IN TEXAS SCHOOL DISTRICTS

Numerous studies over the past decade have reported that the American educational system is not adequately preparing students for meeting the needs of a changing labor market. The federal Carl Perkins Vocational and Applied Technology Education Act (Perkins Act) addresses this concern through funding programs which "integrate academic and vocational education...through coherent sequences of courses so that students achieve both academic and occupational competencies."

The Texas Council on Vocational Education (TCOVE), as the advisory board created by the Perkins Act, was asked by the State Board of Education to identify integration sites in Texas. TCOVE sent a survey to a stratified random sample of 112 school districts in the state. Sixty-five percent of those school districts returned the survey. This evaluation report presents the results of the survey and of extensive research on integration.

Key Components of Integration

The Texas Council on Vocational Education (TCOVE) defines integration as: a process which encompasses applying knowledge and concepts to develop skills, attitudes, and understandings that foster workplace readiness, further educational pursuits, and enhanced quality of life and citizenship. Integration requires time to fully implement. The basic components of integration include:

- Modification of *both* vocational *and* academic courses;
- Collaboration of academic and vocational teachers;
- Coordination of academic and vocational courses into a cohesive program of study; and
- Support of counseling and guidance activities.

Benefits of Integration

Integrating academic and vocational education can provide multiple benefits, including:

- Improving students' preparation for the work force;
- Raising expectations that all students can achieve at a high academic level;
- Reducing segregation of students into ability "tracks";
- Enhancing student participation and attendance in school; and
- Increasing enthusiasm for teaching.

SUMMARY OF FINDINGS

The vast majority of school districts in Texas (84%) are beginning to take steps to integrate academic and vocational education. This widespread thrust shows Texas is moving in the right direction. However, school districts still have a long way to go in the process of achieving the full scope of integration. Only one in four districts has implemented the combination of components which TCOVE defines as integration. In addition, smaller districts are even less likely to be pursuing comprehensive plans or to have begun integrating at all.

- ***Teacher Involvement*** -Teacher collaboration appears to be a key component for successful integration.

- ***Vocational Programs Integrated*** - Health Occupations and Trade and Industrial are the most likely vocational programs to be integrated.

- ***Academic Subjects Integrated*** - Of academic subjects, English is being integrated most often by districts, followed by Math and then Science; Social Studies is involved in the efforts of only a small fraction of districts.

- ***Students Targeted*** - The majority of school districts do not appear to be targeting any particular group of students to participate in their integration efforts.

- ***Impact Data*** - Very little data currently exists on the impact of integrated instruction on students' gains, however, the data that is available is very encouraging. Vocational students at integration sites have closed the achievement gap with college-prep students by 89% in reading, 36% in math and 75% in science. Pilot programs in Texas are beginning to be evaluated now and preliminary data is expected to be released soon.

- ***Many Ways to Integrate*** - The fundamental components of integration can be implemented in a variety of ways; plans will look different depending on the unique perspectives, characteristics and needs of each local school district.

- ***Obstacles to Integration*** - School districts, regardless of size, cited "insufficient release and preparation time for teachers" most often as an obstacle to their integration efforts. Among the "Big 6" school districts (over 50,000 ADA), an equal percentage of respondents said they were hindered by "lack of consistent support from administrators." For smaller school districts (under 10,000 ADA), on the other hand, "insufficient financial resources" was reported as one of the biggest obstacles.

- ***Additional Barriers*** - Most school districts reported that they lack an understanding or knowledge of the concept of integration and nearly half cited the need for expertise/training for teachers and administrators.

- ***Use of Perkins Funds*** - School districts are spending their Perkins funds for integration most

often on: staff development/training for teachers; purchase of computers, software or curricula for learning labs or remedial programs; and additional career counselors or guidance activities.

RECOMMENDATIONS

1. Provide local school districts with guidance on what constitutes the integration of academic and vocational education, including why it is valuable, models of how it can be implemented, funding options and suggested "coherent sequences" of courses, especially for high skill, high wage jobs.

2. Expand the training of teachers and administrators on how to implement a comprehensive integrated academic and vocational curricula from initial pilot sites to the rest of the 1,048 school districts in the state.

3. Review state educational policies to ensure that they facilitate or do not hinder the integration of academic and vocational education. Specifically, graduation requirements should be based on competencies gained, not on courses taken, credits, or essential elements. The state should identify the academic and occupational competencies needed for various clusters of jobs, with input from local school districts and the business community.

4. Focus attention on identifying special needs or barriers that smaller school districts may have in implementing integration.

5. Develop mechanisms to allow teachers time and compensation to collaborate on integration planning and activities during the school year and summer months.

6. Allow flexible scheduling of courses to enable academic and vocational teachers to implement innovative integration practices.

7. Coordinate funding mechanisms at the federal, state and local levels so that resources outside of vocational education contribute to the process of integrating academic and vocational education.

8. Involve academic teachers and administrators, and counselors, as well as vocational staff, in technical assistance workshops and conferences on integration.

9. Define the outcomes expected of integrated academic and vocational education and develop performance measures to evaluate the success of integration efforts.

10. Examine teacher training policies and programs in institutions of higher education to make future generations of teachers more receptive to applied and interdisciplinary instructional methods.

Introduction

DIVIDED EDUCATIONAL SYSTEM

The basic structure of the American educational system has not changed since the turn of the century. At that time, learning "of the hand" and "of the mind" were split into separate domains in response to workplace and other demands spawned by the Industrial Revolution. Before then, educators understood that using tools and manipulating materials was a way to "train the mind by training the hand."[1] As long as most of us can remember, though, schools have been organized by disciplines, with each academic subject taught "in the abstract" in a separate course. Vocational education, on the other hand, has come to be considered the realm of training for work exclusively, in which occupationally-specific skills are gained.

Students' Needs Not Met

One of the consequences of this pedagogical separation is that students, especially the 70 percent who are work bound, do not see the relevance of learning academic skills to their lives. Many of these students are not performing satisfactorily in required academic courses. Often, they are relegated to low-level, unchallenging remedial classes. Many are at risk of dropping out of school.

College-bound students, on the other hand, while they may be adept at passing tests based on rote memorization, often do not know how to apply abstract academic concepts. They do not gain the practical problem-solving skills needed in the workplace today.

Work Force Needs Not Met

Over time, this divided educational structure has also proven to be inadequate for meeting the needs of a changing labor market. The size and composition of the work force is projected to change dramatically by the year 2000 with the entrance of more women, minorities and immigrants. At the same time, most new jobs will require higher levels of language, math and reasoning skills, according to the 1987 Hudson Institute report, *Workforce 2000.*

Numerous studies released in the past decade have warned of a mismatch between the abilities of new workers and the increasing skill requirements of future jobs. More than half of youth today

"This divided educational structure has proven inadequate for meeting the needs of a changing labor market."

leave high school without the fundamental skills needed to successfully perform on the job , according to the 1991 Secretary's Commission on Achieving Necessary Skills (SCANS) report from the Department of Labor. Such reports call for American schools to improve the preparation of students for the work force.

Perkins Act Addresses Concerns

In the 1990 reauthorization of the Carl Perkins Vocational and Applied Technology Education Act (Perkins Act), Congress responded to these work force needs. The focus of the Act is stated in its single purpose "to make the United States more competitive in the world economy by developing more fully the academic and occupational skill of all segments of the population." The Act specifies that a principal way in which this goal can be achieved is by focusing funds on programs which "integrate academic and vocational education...through coherent sequences of courses so that students achieve both academic and occupational competencies." The SCANS report also concludes that basic skill competencies "should be taught and understood in an integrated fashion that reflects the workplace contexts in which they are applied."

PURPOSE OF REPORT AND METHODOLOGY

The Texas Council on Vocational Education (TCOVE), as the advisory board created by the Perkins Act, has been asked by the State Board of Education to determine the status of integration in schools in the state. Specifically, the Board requested that TCOVE "identify sites where the integration of academic and vocational education is occurring and evaluate the effectiveness of the integrated instruction as it relates to student gains."

In responding to this request, TCOVE designed and sent a survey to a stratified random sample of 112 school districts. Sixty-five percent of those school districts returned the survey. (See Appendix A for survey instrument.) This report presents the results of an analysis of the survey as well as interviews with school personnel from individual integration sites and extensive research on integration.

"Integrating academic and vocational education is designed to combine the best practices of both realms..."

BENEFITS OF INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION

Integrating academic and vocational education is designed to combine the best practices of both realms to teach academic skills in the more concrete, group-oriented and participatory style typi-

cally employed in vocational education. The benefits of restructuring the educational system in this way are many:

Table 1
Benefits of Integrating Academic and Vocational Education

- Improves students' preparation for the work force
- Raises expectations that all students can achieve academically
- Reduces segregation of students into ability "tracks"
- Increases enthusiasm for teaching
- Enhances student participation & attendance

- **Improves students' preparation for the work force.** Integration strengthens academic competencies of vocational students, both basic skills, along with higher order thinking and problem-solving skills. By providing a coherent sequence of both academic and vocational courses leading to an occupational cluster or career pathway, students can gain the broad occupational preparation and competencies needed on the job.
- **Raises expectations that all students can achieve at a high academic level.** Most people learn and retain abstract concepts most effectively through applied and experiential instructional methods, according to principles of cognitive science. Integration, which uses such methods to teach both academic and occupational competencies, can lead to increased enrollment and achievement by all students in high-level, challenging academic courses.
- **Reduces the segregation of students into ability "tracks."** By acknowledging that students have different learning styles and by using applied, "hands-on" and cooperative learning methods to teach abstract academic concepts, integration of academic and vocational education raises expectations that all students can master college-level academic material. By making learning more relevant to work and students' roles in life, it can make vocational education more accessible to college-bound students and advanced academic courses more accessible to students concentrating in vocational education.
- **Increases enthusiasm for teaching.** Teachers are at the core of this reformed instructional strategy. By providing opportunities for academic and vocational instructors to work together to develop instructional materials and coordinate course content, integration reduces the isolation of teachers. The "sense of a

"By making learning more relevant to work...integration can make vocational education more accessible to college-bound students and advanced academic courses more accessible to students concentrating in vocational education."

common enterprise in shaping the education of young people"[2] can generate increased enthusiasm for teaching which, in turn, enhances student learning.

- **Enhances student participation and attendance.** Students are most interested and engaged in school when they can see the value of learning to their daily or future lives. By teaching the relevance of academic subjects to occupations and roles in real life, integration can increase all students' attendance in school and motivation to learn.

Table 2
What Is Integration?

Council's Working Definition:

Integration is a process which encompasses applying knowledge and concepts to develop skills, attitudes, and understandings that foster workplace readiness, further educational pursuits, and enhanced quality of life and citizenship.[3]

Components of Integration:

- Modification of both vocational and academic courses
- Collaboration of academic and vocational teachers
- Coordination of academic & vocational courses into a cohesive program of study
- Support of counseling & guidance activities.

DEFINING INTEGRATION

TCOVE began its evaluation with a working definition of integration, adopted from a Colorado task force. (See Table 2 above.) TCOVE also reviewed the literature to determine how researchers and reformers have interpreted the intent of Congress with regard to integration. A general consensus emerged on the essential components involved in full integration, which include:

- **Modification of *both* vocational *and* academic courses.** One dimension of integrating academic and vocational education is *within* courses. Integration is a new instructional model in which academic and vocational skills are taught in parallel, within the same time frame, not in the traditional sequential, fashion. Therefore, both types of courses must be changed: 1) Fundamental academic concepts are taught in academic courses in an applied way that shows the value of learning to students' lives and future work and enables them to master high-level

"Integration... encompasses applying knowledge...to foster workplace readiness, further educational pursuits, and enhanced citizenship."

academic content; and 2) Students strengthen and reinforce academic competencies in vocational courses by using them in performing specific occupational tasks. (A vocational teacher working independently to incorporate more writing or math into vocational courses is only half of the integration equation.) Many approaches throughout the country are used to accomplish this component of integration.

Vendor-Developed Curricula

National, vendor-developed Applied Academics curricula are widely distributed. They present applications of abstract academic concepts from a broad variety of vocational subjects, in place of traditional academic courses. Such materials may be tailored to specific vocational areas so that separate algebra courses can be taught to home economics students and to health occupations students.

Teacher-Developed Academic Curricula

Teachers also collaborate to develop their own curriculum which combines academic instruction with lab exercises in which concepts are applied. For example, an applied biology class in a high school in Oklahoma teaches students about the characteristics of living things by rotating them through a number of lab stations containing objects such as a goldfish, a rock, and a radio. They examine the objects and record whether they are living or non-living and why. The students then discuss what they have observed and learned from the exercises. (*Making High Schools Work*, p. 51.)

Teacher-Developed Vocational Curricula

A welding class at a high school in Maryland demonstrates how a vocational course can be modified so that students exercise and reinforce the academic competencies they have learned in integrated academic courses. Students use a number of math concepts to figure out how to build a railroad "bumper box." They determine how much steel and other materials to purchase, the time needed to complete the job, the welder's salary, the total cost of the job, and what to bill the railroad so that the welding company makes a profit. In a written essay, the students tell what they learned from the project, which math concepts they used in completing the assignment, and whether they think a math background is necessary for someone who is considering a job in welding. (*Making High Schools Work*, p. 92.)

"...a vocational course can be modified so that students reinforce the academic competencies they have learned in integrated academic courses."

Coordinating Subject Matter

Teachers can also integrate academic and vocational education by correlating or coordinating their lesson plans. Concepts are taught in academic courses when they are needed to perform occupational exercises in vocational courses. For example, in math class, students could learn the concepts required in production -- such as measurement, area, volume, and the algebra associated with electricity and heat transfer -- and then apply those concepts in a production exercise in their industrial arts lab.

Coordinating academic and vocational courses can also be accomplished by teaching a common theme or schoolwide project for a specified period of time. Teachers in every class deal with some aspect of the theme. For example, using the theme of campus beautification, students would perform different functions for the project in each of their courses: publicity in marketing and journalism courses; design in drafting, geometry and landscape design courses; and resource management in English, accounting and microcomputer applications courses.

Customized Instructional Materials

Another approach emphasizes developing instructional materials which demonstrate the relationship of academic skills to occupational tasks. Academic and vocational teachers work together to identify all the academic competencies required for the performance of various occupational tasks. They develop an activity sheet for each academic skill. Each student would then be able to select an activity sheet that would apply the academic competency he/she was learning to his/her occupational interest. For example, in an integrated algebra course, an activity sheet for health occupations students could demonstrate how to solve problems using linear equations. It would show how that academic skill is used by a nurse to change the concentration of a drug before administering it to a patient. In their health occupations course, the students would then perform the task in the lab.

"Integration at the course level can involve nontraditional structures and scheduling."

Fused Courses

Integration at the course level can involve nontraditional structures and scheduling also. Vocational and academic courses can be fused together during the same, two- to three-hour block of time in which students learn both academic and vocational competencies. For example, academic and vocational instructors could team teach an integrated, hands-on

Biology I course in which students learn all the appropriate essential elements through a 10-acre garden project for academic and vocational credit.

- **Collaboration of academic and vocational teachers.** The expertise and cooperation of both types of teachers are needed for successful integration. When academic and vocational teachers work together, they serve as resources for one another. Academic teachers can identify the academic skills underlying various occupational tasks and vocational teachers can provide examples from occupational areas which can be used to reinforce and apply the academic skills in vocational courses. Cooperation of teachers fosters improved communication between disciplines and the professional alliance can generate renewed enthusiasm for teaching.

"The expertise and cooperation of both types of teachers are needed for successful integration."

- **Coordination of academic and vocational courses into a cohesive program of study.** The Perkins Act states that integration should include a "coherent sequence of courses." This means that not only should individual courses be integrated, but students should be provided with a recommended program of study for high school which encompasses both the academic and vocational courses required for various occupations. The courses should be scheduled in a logical order so that academic and occupational competencies are taught in tandem.

- **Support of counseling and guidance activities.** Integration thrives in a general climate of career awareness. The participation of career and guidance counselors is essential to ensure that students are aware of the programs of study available to them and to help them choose particular classes to take and an appropriate curriculum pathway. Career exploration courses in middle school or junior high can be used to introduce students to different occupational clusters and help them understand the value of the curriculum sequence they will be choosing in high school.

Integration Efforts in Texas

INTEGRATION: A DYNAMIC PROCESS

A survey of school districts was designed to identify sites in Texas where integration is occurring. Evaluation of the surveys revealed varying practices which did not all look like the integration ideal defined by TCOVE in Table 2. For example, in some schools, vocational teachers were only working independently to incorporate more basic academic skills into their vocational courses or providing remedial education to vocational students. Those changes represent only the vocational half of the integration equation, though. If schools interpret those efforts alone as constituting integration, then Texas school children will not gain the expected benefits. However, those efforts should be viewed as initial *steps* in a process, leading ultimately toward full integration.

TCOVE believes that the implementation of integration is a dynamic process. As with any restructuring, efforts to integrate academic and vocational education should be expected to be phased in over time. Most of the integration experts agree that it will take a minimum of three to five years to fully implement integration reforms. Thus, the survey was designed to identify the *degrees* of integration being undertaken by school districts in Texas currently.

"...experts agree that it will take a minimum of three to five years to fully implement integration reforms."

EXTENT OF INTEGRATION

Survey respondents were asked to identify all of the integration activities they have pursued in the last two years. Eighty-four percent of school districts in the sample indicated that they have taken some steps to integrate. Of those districts, 76 percent of high school campuses are participating in their district's integration efforts.

The number of activities or steps taken varied from none (16 percent of respondents) to 10 at one school district, with the average being three. Small school districts (under 1,000 ADA) were much more likely to report that they had not begun to integrate at all.

Of those districts pursuing integration, Table 3 on the next page

lists the percentages of school districts undertaking various integration activities. The most common integration steps undertaken by school districts were: upgrading the academic component of vocational courses (by 72 percent of districts), using applied methods to teach academic courses (61 percent), and offering remedial education to vocational students (51 percent). School districts were least likely to be utilizing locally developed or vendor-developed Applied Academics curricula (probably because the latter has not been approved for credit by the Texas Education Agency), or teaching a common theme in vocational and academic courses for a specified period of time.

"The *scope* of the integration projects varies by district."

Table 3
Percent of School Districts Taking Various Steps to Integrate Academic and Vocational Education
1991-1993

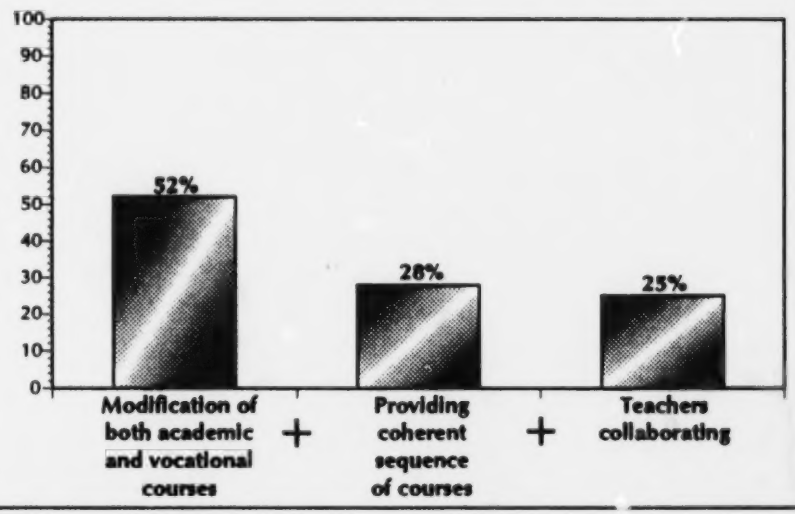
% of Districts		Integration Activity
72%	-	efforts to incorporate and apply academic competencies in vocational courses;
61%	-	efforts to revise academic courses to explain abstract concepts by applying them to real-life and occupational situations;
51%	-	remedial education, learning labs, or tutoring in basic skills for vocational students;
46%	-	developing career introduction or exploration courses;
46%	-	coordinating the teaching of academic and vocational courses so that the subject matter is reinforced in both types of courses;
46%	-	providing recommended programs of study with sequences of both academic and vocational courses related to particular careers or occupational clusters.
25%	-	utilizing Applied Academics curricula--vendor-developed but modified locally;
21%	-	coordinating academic and vocational courses by teaching a common theme across several courses;
16%	-	none
12%	-	utilizing Applied Academics curricula--vendor-developed;
8%	-	utilizing Applied Academics curricula--locally-developed.

The *scope* of the integration projects also varies by district. Efforts range from only altering the vocational side of the integration equation, either providing remedial education for vocational students or upgrading the basic academic skills component of vocational courses, to full-fledged integration in which vocational and academic teachers collaborate to revise both types of courses

and then coordinate them into a coherent program of study.

The scope of integration efforts undertaken by districts is illustrated in Chart 1. As shown in the chart, as the integration becomes more comprehensive, the number of schools achieving that degree of integration becomes smaller. Among the districts that were taking some steps to integrate, 52 percent were modifying *both* academic and vocational courses: upgrading the academic component of vocational courses *and* using occupational applications to teach their academic courses. Only 28 percent of schools were *also* providing a coherent sequence of academic and vocational courses corresponding to various career paths. Finally, when teacher collaboration is added, only one in four school districts was achieving the full scope of integration as defined by TCOVE. Small school districts (under 5,000 ADA) were even less likely to be integrating to each of these degrees.

Chart 1
Scope of Integration
Undertaken in Texas School Districts



"...only one in four school districts was achieving the full scope of integration."

TEACHER INVOLVEMENT

Another key measure of integration is whether academic and vocational teachers are collaborating. In 66 percent of the school districts which said they had taken some steps to integrate, teachers collaborate in some capacity, either coordinating course content, developing courses or instructional materials, or team teaching, and in many cases, they are working together in more than one of those ways.

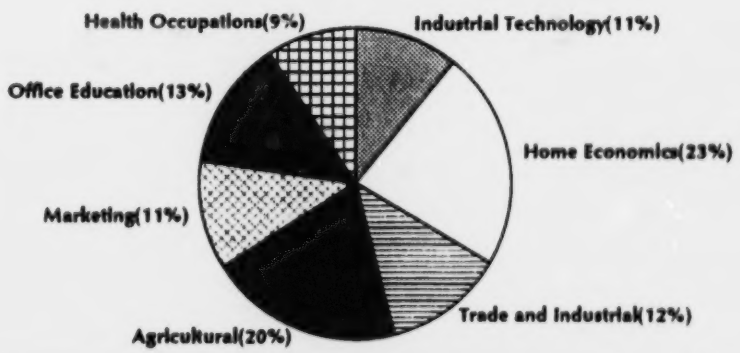
In 34 percent of the school districts which indicated they are taking some integration steps, however, vocational and academic teachers work independently of one another. Those districts, in which teachers are not collaborating in any way, are more than 50 percent less likely to be integrating within both types of courses and then developing a coherent sequence of those courses into a program of study. Teacher collaboration seems to be a key component to successful integration.

"Teacher collaboration seems to be a key component to successful integration."

COURSES TARGETED

Every type of vocational program offered in Texas schools is involved in current integration efforts. See Chart 2 for the percentage breakdown of types of vocational programs being integrated. Of all the programs being integrated, Home Economics (23 percent) represents the largest share, followed by Agriculture (21 percent), primarily because those vocational areas are much more likely to be offered in Texas schools than other programs. Every district that responded to the survey reported Home Economics among their array of programs, and 92 percent of the districts offer Agriculture.

Chart 2
% of All Vocational Programs
Being Integrated by Type of Program

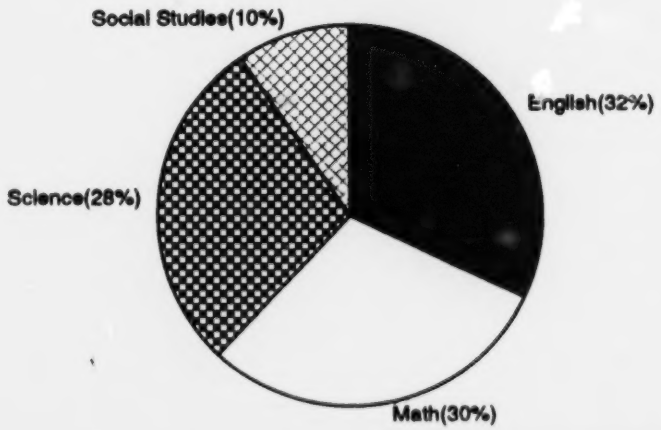


However, other vocational programs are more likely to be involved in integration efforts than either Home Economics or Agriculture. Only 61 percent of all Home Economics programs and 58 percent of Agriculture programs are being integrated, compared with 82 percent of Health Occupations programs and 80 percent of Trade & Industrial programs.

Among academic subjects involved in district integration

efforts, English/Language Arts represents the largest share (32 percent), followed by math (31 percent) and science (28 percent). Social studies comprise a much smaller fraction of the total (9 percent). (See Chart 3 below.)

Chart 3
% of Academic Subjects Being Integrated by Type of Subject



Of the districts that have begun to integrate, 60 percent are integrating their English classes, 56 percent are including math in their integration efforts, followed by Science (52 percent of districts) and Social Studies (15 percent).

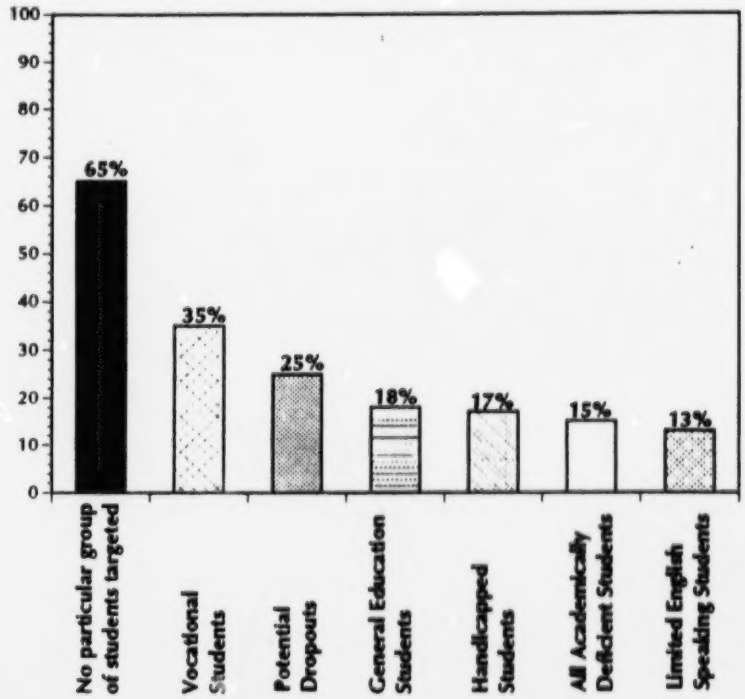
STUDENTS TARGETED

One objective of the survey was to determine if efforts undertaken by school districts in Texas to integrate academic and vocational education are intended to help particular groups of students or the general student body. From the survey results, it would appear that most school districts are not limiting their efforts to any specific population or viewing integration as a program only for the academically disadvantaged. Sixty-five percent of school districts indicated that they were not targeting any particular group of students.

Of the districts that *were* targeting particular groups of students, vocational students and potential dropouts were the groups reported most often. (See Chart 4 on next page.)

"Sixty-five percent of school districts... were not targeting any particular group of students."

Chart 4
% of Districts Targeting
Various Groups of Students

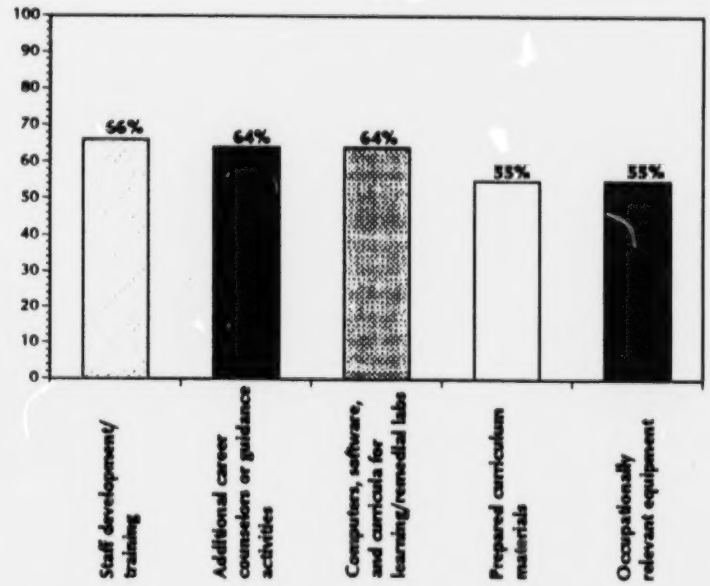


Note: The categories do not add up to 100% because many districts checked more than one category.

USE OF PERKINS FUNDS BY DISTRICTS

During the period from 1991-1993, 77 percent of the school districts that have taken steps to integrate applied for federal Perkins funds. Of those who applied, they spent their money in the following ways on their integration efforts. The top five uses of the funds include: 66 percent on staff development/training; 64 percent on computers, software, or curricula for learning labs or other remedial programs; 64 percent on additional career counselors or guidance activities; 55 percent on the purchase of prepared curriculum materials; and 55 percent on the purchase of occupationally relevant equipment. (See Chart 5 on following page.)

Chart 5
% of Districts Reporting Various Uses of Perkins Funds



Impact on Student Gains

OUTCOME MEASURES

How the integration of academic and vocational education is evaluated depends on the objectives behind the effort. Pre- and post- student attitude surveys, class attendance and school dropout rates are ways to detect increases in students' motivation and engagement in school. Decreases in course failure rates and scores on state and national tests can measure students' achievement. Assessments of competencies gained and employers' opinions can be used to evaluate students' preparation for the work force. Finally, the number of students "crossing over," that is, vocational students taking college-preparatory level academic courses and college-bound students enrolling in vocational courses can be used to measure the accessibility of an integrated education to all students and indicate whether tracking is being eliminated.

INTEGRATION OBJECTIVES IN TEXAS SCHOOLS

School districts in Texas that are integrating cited multiple outcomes expected for their efforts, with the top three being: improve students' preparation for the work force (84 percent), improve students' thinking and problem-solving skills (78 percent), and improve students' awareness and knowledge of career choices (73 percent). Other objectives that were cited most often by districts include: reduce dropout rates/increase daily attendance rates (64 percent), better prepare students for district- or state-level competency tests (64 percent), increase the attention and motivation of students for learning (62 percent), and improve basic academic skills of vocational students (62 percent). It is not clear whether any of the districts had any indicators in place to evaluate the success of their integration efforts in achieving these objectives, however. Most school districts appear to be still in the planning and implementation phases of their integration efforts.

In fact, methods to measure the outcomes of integration are still being developed throughout the country. Since the integration process is expected to take at least three to five years to implement, and most efforts did not begin until after the 1990 Perkins amend-

"...methods to measure the outcomes of integration are still being developed throughout the country."

ments took effect, very little data assessing the impact of integrated instructional strategies has been compiled as yet.

INITIAL PILOT SITE EVALUATION

In Texas, the four initial pilot sites implemented under the "Blueprint for Integrating Academic and Vocational Education" model (see description under State Leadership section) developed by the Educational Development and Training Center at East Texas State University have just finished the implementation phase of their integration efforts. Educators at Mansfield High School are currently conducting some preliminary impact studies. They are using three measures to judge their integration efforts: 1) pre- and post-student attitude surveys; 2) a learning styles inventory which assesses the impact of differing instructional methods depending on a child's learning style; and 3) scores on the NAPT (Norm-referenced Assessment Program for Texas) statewide achievement test.

"...students at the SREB pilot sites closed the achievement gap by 89% in reading, 36% in mathematics, and 75% in science..."

PRELIMINARY IMPACT DATA

The High Schools That Work model for integrating academic and vocational education, developed and led by the Southern Regional Education Board (SREB) (see description under State Leadership section), was one of the few projects begun before the 1990 reauthorization of the Perkins Act. As a result, some data on the impact of its recommended strategies on student gains is available. SREB sites use a common assessment process which includes:

- Student and faculty surveys measuring perceptions of high school;
- Student test scores in reading, mathematics and science on the National Assessment of Educational Progress (NAEP);
- The number and types of courses taken by students in high school as indicated on transcripts; and
- A follow-up survey one year after graduation to determine the status of former students.

Data collected by SREB is based on results of the evaluation measures from the eight original "High Schools That Work" integration pilot sites after two years. SREB compared NAEP test scores of students at the pilot sites with the national average of students enrolled in college preparatory programs and found that students at the SREB pilot sites closed the achievement gap by 89 percent in reading, 36 percent in mathematics and 75 percent in science from

1988 to 1990. (See Charts 6-8.)

Chart 6
Average NAEP Reading Scores of Students Completing Vocational Programs at SREB Pilot Sites Making Greatest Gains

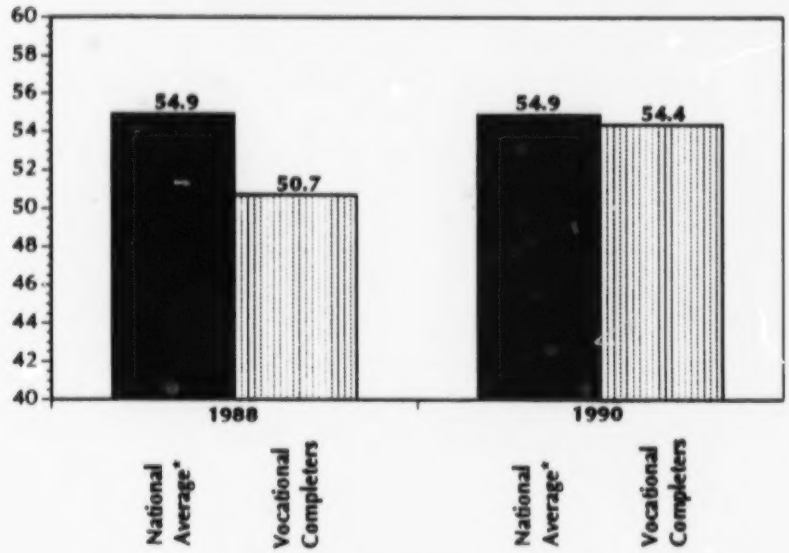
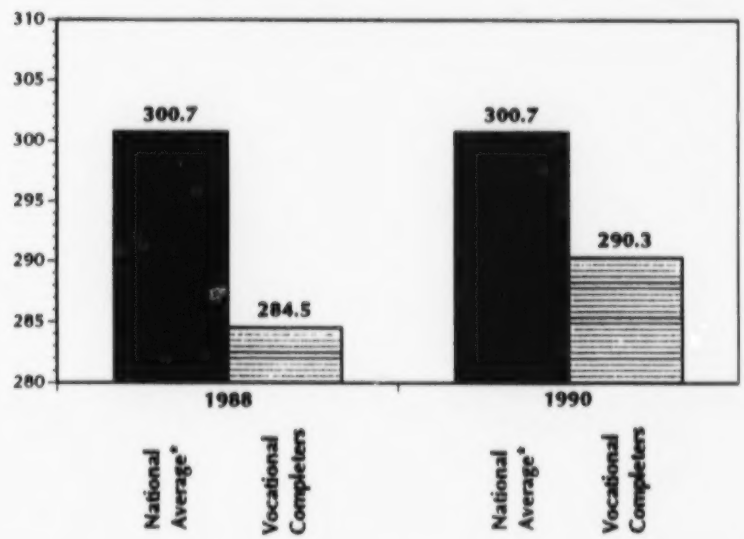
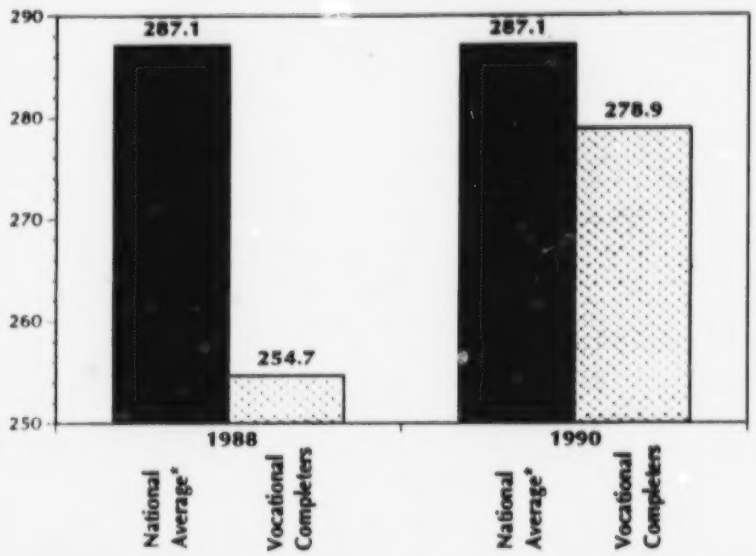


Chart 7
Average NAEP Mathematics Scores of Students Completing Vocational Programs at SREB Pilot Sites Making Greatest Gains



*National values are based on public high school students in the 1986 NAEP national sample who were enrolled in a college preparatory program.

Chart 8
Average NAEP Science Scores of Students Completing Vocational Programs at SREB Pilot Sites Making Greatest Gains



*National values are based on public high school students in the 1986 NAEP national sample who were enrolled in a college preparatory program.

SREB further tied the improved test scores to the applied and integrated methods of teaching used at its pilot sites by correlating them with specific courses taken and with student attitude surveys. They found:

- Students who were able to see the practical value of math and understand its application to future work generally scored higher on the NAEP. (See Table 4 on following page.)
- Students who took vocational courses in which the teachers incorporated the use of reading, mathematics and science skills performed better on the NAEP. (See Table 5 on page 20.)
- Vocational students, who were more likely to take fewer math classes and more lower-level math classes than college-preparatory students, performed better against college-preparatory students in math applications and problem-solving (only 10 percent below) than in math knowledge (14 percent below). (See Table 6 on page 20.) SREB concludes that the applied methods through which math is taught at the pilot sites may "help improve the ability of students to use their more limited math knowledge to solve problems." (*Making High Schools Work*, p. 47.)

"SREB further tied the improved test scores to...integrated methods of teaching."

- Students at one pilot site (Site B in Table 7) who were enrolled at a much lower rate in traditional, high-level math courses and took fewer math credits overall, but were enrolled at a much higher rate in applied math courses than another pilot site (Site A) averaged slightly higher scores on the NAEP math test. These results suggest, according to SREB, that increasing student achievement "...is not just a matter of enrolling more students in high-level courses; it is also a matter of teaching math in a way that enables students to understand, use and retain what they learn." (*Making High Schools Work*, p.64.) (See Table 7 on page 21).

Table 4
Student Attitudes Toward Usefulness of Mathematics Courses and Corresponding Average Mathematics Achievement Scores
National Assessment of Educational Progress Results for 1990 SREB Pilot Site Vocational Completers

	Percent	Average Math Scores
I feel most math has practical use.		
Strongly Agree	11.3%	296.2
Agree	66.5%	291.6
Undecided	13.2%	282.7
Disagree	7.6%	289.4
Strongly Disagree	1.4%	279.6
Will your career require use of math skills?		
Yes	60.9%	294.1
No	22.5%	285.8
Undecided	16.7%	285.3*
I feel it is important to know algebra and geometry to get a good job.		
Strongly Agree	12.2%	294.8
Agree	39.4%	291.8
Undecided	20.4%	290.3*
Disagree	22.4%	289.4
Strongly Disagree	5.5%	281.0
I feel it is important to know arithmetic to get a good job.		
Strongly Agree	24.5%	298.1
Agree	54.3%	291.2
Undecided	11.4%	282.4
Disagree	7.2%	281.2*
Strongly Disagree	2.6%	275.1

*Unless marked by an (*), the difference in scores is statistically significant.

"...increasing student achievement 'is a matter of teaching math in a way that enables students to understand, use and retain what they learn.'"

Table 5
Extent to Which SREB Vocational Completers Reported That Their Vocational Teachers Stressed Reading, Mathematics, and Science Skills and Corresponding Average Scores

National Assessment of Educational Progress Results for 1990 SREB Pilot Site Vocational Completers

	READING		MATHEMATICS		SCIENCE	
	Percent of Vocational Completers	Score	Percent of Vocational Completers	Score	Percent of Vocational Completers	Score
Often stressed	48%	53.8	57%	293.1	26%	271.9
Never stressed/Could not recall being stressed*	23%	51.1	17%	284.0	42%	261.3

*Represents data collapsed from two of four possible responses. Percentages were combined, and a weighted average was correlated.

Note: Percentages have been rounded and do not add to 100 because one other response was available. The difference in scores is statistically significant.

Table 6
Comparison of Correct Responses By 1990 SREB Vocational Completers and College Preparatory Students Nationally on NAEP Mathematics Test Items

	SREB VOCATIONAL COMPLETERS	NATIONAL COLLEGE PREPARATORY STUDENTS
Problem Solving/Reasoning	43.7%	53.6%
Routine Application	55.5%	64.5%
Understanding/Comprehension	46.1%	57.9%
Skill	60.9%	71.8%
Knowledge	53.7%	67.8%

Source: SREB-State Vocational Education Consortium Student Assessment Results. National values based on 1986 data.

Table 7
Comparison of Mathematics Experience and Average NAEP Math Scores by 1990 Vocational Completers at Two High-Achieving Pilot Sites

	SITE A	SITE B
General Math	4%	52%
Pre-Algebra	54%	1%
Algebra I	88%	67%
Algebra II	60%	37%
Geometry	82%	46%
Higher Level Math	18%	14%
Applied Math	2%	46%
Total Math Credits	3.3	2.6
Completed 2 Upper Level Math Courses	79%	38%
NAEP Scores	296.8	298.5

Note: The percentages and the credits were derived from an analysis of student transcript information. The math scores represent the achievement of 1990 vocational completers at two sites on National Assessment of Educational Progress math tests. The two sites are comparable in size, school organization, and socioeconomic background of students tested. The difference in scores is statistically significant.

Source: *Making High Schools Work*, SREB.

Integration Sites

The results of TCOVE's secondary surveys present a statistical profile of the steps school districts are taking to integrate academic and vocational education in the State of Texas. They describe the scope and extent of beginning integration efforts during the past two years. How those efforts are being put into practice and what integration looks like varies greatly from one district to another depending on local interpretations and objectives of integration, the composition of their student bodies, local labor markets and other particular needs and circumstances. The following examples illustrate innovative approaches to integration which are being implemented in Texas schools.

SPRING BRANCH ISD: EARLY CAREER AWARENESS

At Spring Branch ISD, initial efforts to integrate academic and vocational education focus on career awareness before students enter high school. Educators there believe that one of the keys to successful achievement in high school is advance preparation in middle school. Thus, their Academic Integration Model of Career Awareness Curriculum is a pilot project at Northbrook Middle School which focuses on introducing all 8th grade students to career opportunities, including those requiring postsecondary training, and then counseling them on a four-year high school schedule of courses to pursue the career goals they have identified. "Students have the opportunity to view what high school has to offer them," according to the Spring Branch literature.

The Spring Branch model is a six-week project in which career awareness activities and life skills are integrated into the four core courses using essential elements. An interdisciplinary team of academic and vocational teachers work together to write the curriculum and coordinate activities among the courses. Students actively explore career options and make their own choices.

For example, in language arts and ESL courses, students complete a career assessment battery, research a career/occupation, write a paper or give a multi-media presentation about their selected occupation, and write a proposal for a company. In science class, their tasks include predicting average salaries of people in

"The Spring Branch model is a six-week project in which career awareness activities and life skills are integrated into the four core courses."

various occupations and at various educational levels and projecting future occupations. Among the lessons completed in social studies are researching economic information about daily life through the newspaper and analyzing the various economic needs of average Americans. Finally, in mathematics, students interpret bar graphs, collect data and analyze stock market data to make predictions about the futures of companies.

Spring Branch's vision for integrating academic and vocational education continues once students reach high school. At that level, the program is called Strategies for Academic Success (SAS). It is a tech-prep model of integrating academic and vocational education that begins in the 9th grade. Again, academic disciplines are taught in relation to students' particular career choices. For example, in English class, a student may be given an assignment to write a description of her vision of an ideal career and what she's doing in school to achieve that. Students work in groups and perform "hands-on" activities with appropriate "props." For example, special tiles are used to visually present algebra concepts such as polynomials. Groups of teachers work together, sharing a common 23-minute period during the day to plan. Algebra and English teachers also co-teach an SAS lab to give extra help to students who need it.

"Pampa High School's vision...reflects the school district's mission 'to graduate responsible, adaptable, creative and successful citizens.'"

PAMPA HIGH SCHOOL:
MAKING SCHOOL RELEVANT TO LIFE

Chosen as one of the state's integration pilot sites which are supported by a Perkins grant, Pampa High School's vision of integrating academic and vocational education reflects the school district's mission "to graduate responsible, adaptable, creative and successful citizens..." Their desired outcome was for the middle 50 percent of students to recognize that the total school experience is relevant." Pampa decided to start by trying to make English more relevant to students. They designed two new courses: an integrated English I course "supported by vocational education" and a vocational course "supported by English."

On the academic side of the integration equation, a Home Economics and English instructor were paired to design the English I course and team teach all its essential elements in an applied way. The content of the original English I curriculum remained intact, but "hands-on" activities in vocational labs were added to make it more meaningful. For example, the students didn't just read *Romeo and Juliet*, they performed an activity for each act of the play, spending time in the home economics lab designing costumes and in the print shop making invitations.

The English teacher observed that many students who did not normally excel at "pencil and paper" tasks did exceptionally well with the varied learning style. They discussed themes in the play such as family life-styles and parent-teen conflicts in terms of how the characters' lives related to their own. "The students realized that people have not changed much over 400 years; and they could relate to the teenage problems of those young lovers of long ago," Mary Sturgeon, the English teacher said.

Another English lesson taught in the home economics lab demonstrated how grammar relates to work with an exercise that required students to design a packaging label for a product. Students learned how important the order of written words–or how detrimental a misplaced adjective–can be to the selling of a product. At the same time, the students were introduced to a career field, commercial design, in which they may want to apply their talents in the future. Pampa is now using its integrated English I course to teach all 9th graders.

The second component of Pampa's initial integration efforts is a vocational course which incorporates academic competencies from English. The senior-level Marketing I elective course was redesigned and named Entrepreneurship. In the course, students learn to design and build a product, write a report on it, present it to a Board of Directors and market it. It is team taught by five teachers: in Marketing, English, Wood Shop, Metal Shop, and Computer Applications. Students go into the various labs to complete the relevant parts of the project. They integrate and incorporate material they've learned previously from other courses and exercise skills needed on the job such as thinking, problem-solving, oral and written communications and math skills. The course was designed to attract college-bound students as well as work-bound students and it succeeded in that goal the first time it was offered.

"...many students who did not normally excel at 'pencil and paper' tasks did exceptionally well with the varied learning style."

Barriers and State Initiatives

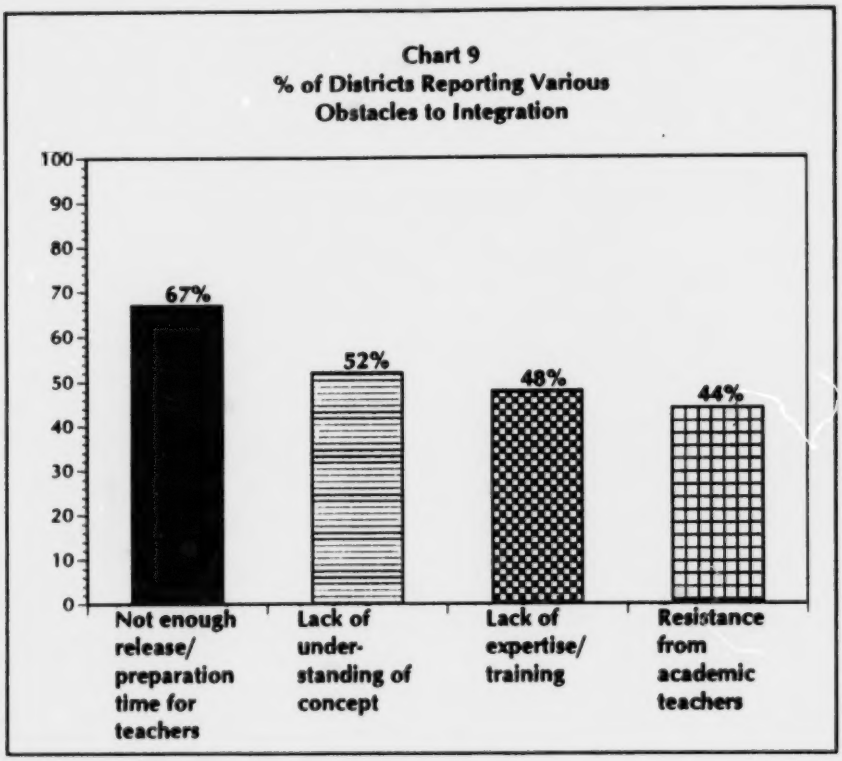
OBSTACLES TO INTEGRATION

As school districts have begun to integrate academic and vocational education, they have confronted obstacles in their attempts to change. Survey respondents most frequently reported being hindered by "not enough release and preparation time for teachers" (67 percent) . Most districts (52 percent) also said they were hampered by a "lack of understanding/knowledge of the concept of integration" and nearly half (48 percent) indicated that they needed expertise/training for teachers and/or administrators. Finally, a substantial minority (44 percent) encountered resistance from academic teachers. (See Chart 9 on following page.)

The obstacles varied somewhat with the size of the district. The six largest school districts (over 50,000 ADA) were as likely to report that a lack of consistent support from administrators hindered their integration efforts as a lack of release/preparation time for teachers. For smaller districts (under 10,000 ada), on the other hand, "insufficient financial resources" was reported as an obstacle by 67 percent of districts. The school districts that had not begun to integrate reported a variety of reasons for their lack of integration, ranging from not seeing or understanding the need for integration, to a shortage of staff development or release time, to funding problems.

Survey respondents were also asked their reactions to various state policies and practices. School districts considered most of them helpful, with the greatest number citing in-service activities/ training (85 percent) and workshops/technical assistance about integration (77 percent) as encouraging their efforts. Competency-based course content or objectives (63 percent) and competency-based testing requirements (57 percent); state development of integrated curricula (62 percent); and new equipment for integration efforts (62 percent) were cited next most often. Districts were divided on the effect of state graduation requirements on the pursuit of integration, with about equal percentages of districts saying it encouraged (33 percent), discouraged (35 percent) and had no effect (31 percent) on their efforts.

"Survey respondents most frequently reported being hindered by 'not enough release and preparation time for teachers.'"



USE OF PERKINS FUNDS FOR STATE LEADERSHIP

Early Initiatives: Network of Pilot Sites and Teacher Trainers

Since the Perkins amendments of 1990, the primary state initiative to promote the integration of academic and vocational education in school districts in Texas has been a project to provide school personnel at selected pilot sites with the professional development and expertise needed to implement integration in their own districts, as well as to serve as trainers for teachers and administrators in other districts.

"...the primary state initiative to promote integration...has been to provide school personnel at selected pilot sites with professional development..."

The Texas Education Agency has contracted with the Educational Development and Training Center (EDTC) at East Texas State University to conduct this project. EDTC has developed a blueprint, or replicative model, for implementing integration. The model is a three-year plan in which planning, program development and staff development are conducted in the first year, changes are implemented in the second year and evaluation is performed in the third.

The focus of the project is on providing school districts with a systematic, step-by-step process for restructuring the curriculum to integrate academic and vocational education. The primary empha-

sis is on staff development. All teachers and administrators involved in the integration efforts undergo extensive training on new teaching techniques, assessment measures and strategic planning. The program takes a team approach, involving representatives of all effected parties in the planning process, including teachers, administrators, counselors, school board members, parents, students and the business community. The trainers abide by a philosophy of local control, that is, they believe each restructuring plan should reflect the unique needs and circumstances of its district and thus, be developed and implemented by the members of the district team.

The EDTC project began in the 1991-92 school year with four pilot sites chosen to represent the diversity in size, location and demographics of Texas public schools. Those sites have just implemented their integration plans during the 1992-93 school year. They have been followed by five additional schools, which have spent the 1992-93 school year planning their integration efforts for next year. EDTC was assisted in training personnel at the new sites by a cadre of teachers, administrators and counselors from the initial pilot projects. (See Appendix C for a complete list of pilot sites and contact names.)

"The SREB approach creates an equally rigorous, 'tech-prep' pathway...for work bound students that parallels the college-prep curriculum."

Current Plans: "High Schools That Work"

The most recent state leadership activities in the area of integration of academic and vocational education are three-fold. First, as a member of the Southern Regional Education Board, the Texas Education Agency (TEA) will be using its Perkins funds to enable local school districts to apply for the 1993-94 school year to join the network of "High Schools That Work," the SREB-recommended model for integrating academic and vocational education. (The local school districts will be required to match the Perkins grant provided by the state with their own local, non-Perkins funds.) In 1992, the SREB-State Vocational Education Consortium consisted of 100 sites in 19 states. The SREB stresses raising expectations about the ability of non-college bound students to master high-level academic concepts. Its approach to integrating academic and vocational education creates an equally rigorous, "tech-prep" pathway, or structured curriculum, for community-college or work-bound students that parallels the college-prep curriculum. The SREB model, in addition to integrating *within* academic and vocational courses, requires students to complete a related program of study, with a minimum number of high-level academic courses and vocational courses. Like EDTC, the SREB Consortium supplies technical assistance and leadership to create the organizational and adminis-

trative conditions for integration to take hold. TEA is now soliciting school districts for participation in the program.

"Mini Grants" for Teachers

Second, TEA will be providing approximately 20 "mini grants" for the 1993-94 school year directly to teams of academic and vocational teachers to develop their own methodologies and instructional materials for integrating academic and vocational education, including funding joint planning time.

Workshops for Academic Administrators

Finally, in recognition of the need to inform academic personnel of the benefits of integration and involve them in the process in order for it to be successful, the state is planning to target superintendents and principals for participation in staff development activities on integration. The money will be set aside for training on all the vocational education reforms through the Educational Service Centers.

Recommendations

CONCLUSION

Integration of academic and vocational education is a promising, innovative teaching strategy based on principles of cognitive science about how people learn. TCOVE believes integration can effectively address the need to prepare Texas students for the work force.

School districts throughout the state are beginning to implement the integration process. The process must be continued and expanded to the full extent if Texas school children are to gain the expected benefits. In order to facilitate the implementation of integration, more state leadership is needed. Since teachers are the foundation of this educational strategy, initiatives targeting teachers and providing them with the flexibility to restructure the curriculum are especially important.

Integration should be viewed as a restructuring of the whole school system, not just a reform of vocational education. Although the financial impetus to integrate academic and vocational education is coming from the vocational side of the equation now, the academic side must become a full and equal partner in order for integration to be successful.

Specific recommendations to address these integration issues in the state of Texas are listed below.

"There is a need for more professional development for campuses to understand how integration can occur."
– Survey Respondent (Small school district)

RECOMMENDATIONS

1. **Provide local school districts with guidance on what constitutes the integration of academic and vocational education, including why it is valuable, models of how it can be implemented, funding options and suggested "coherent sequences" of courses, especially for high skill, high wage jobs.**

   Rationale:
   A majority of school districts responded to the Council survey that a lack of understanding or knowledge regarding the concept of integration was an obstacle in their attempts to integrate. In addition, some of the smaller school districts that had not begun to integrate indicated that they did not see a need for

integration. The Perkins Act does not specifically define integration of academic and vocational education nor specify guidelines for coherent sequences of courses for various occupational clusters. Leadership by the state is needed to provide a common conception of integration which districts can use as a framework to design their own plans.

Made to: State Board of Education

2. **Expand the training of teachers and administrators on how to implement a comprehensive integrated academic and vocational curricula from initial pilot sites to the rest of the 1,048 school districts in the state.**

Rationale:

Not only are districts unclear about *what* constitutes integration, but it appears that they also need guidance on *how* to implement integration in their schools. Nearly half of all districts indicated on the survey that a lack of expertise/need for training in integration for teachers and/or adminstrators hampered their efforts to integrate.

The state has made a good start in providing training on integration at its initial pilot sites under the Blueprint for Integrating Academic and Vocational Education conducted by the Educational Training and Development Center at East Texas State University. That kind of in-depth training and planning from the bottom up is very important for effective integration. As a result, those sites appear to be implementing comprehensive integration plans.

However, those efforts have affected only a handful of districts so far. Throughout the state, only one in four districts are implementing the full scope of integration as defined by the Council. Clearly, efforts need to be expanded, for example, through better utilization of teacher trainers or regional workshops at Educational Service Centers.

Made to: State Board of Education

3. **Review state educational policies to ensure that they facilitate or do not hinder the integration of academic and vocational education. Specifically, graduation requirements should be based on competencies gained, not on courses taken, credits or essential elements. The state should identify the academic**

"Teachers and administrators alike need more training to learn how to integrate academic and vocational courses."
– Small school district

"The recommended proficiencies for high school graduation would be more effective if they were required."
– Large school district

and occupational competencies needed for various clusters of jobs, with input from local school districts and the business community.

Rationale:
The Perkins Act specifies that the objective of integrating academic and vocational education should be for students to achieve both academic and occupational competencies. The majority of school districts in Texas cited competency-based course content, objectives and testing requirements as helpful state policies for their integration efforts. Innovative integration practices do not necessarily lend themselves to the confines of traditional course and scheduling structures. Current graduation requirements should not hinder such innovation.

Made to: State Board of Education

"District policies are very supportive as long as additional funds are not expended due to the tight budget."
– Small school district

4. **Focus attention on identifying special needs or barriers that smaller districts may have in implementing integration.**

Rationale:
There is some indication from the survey results that small school districts may need extra help in integrating academic and vocational education. School districts with under 1,000 ada were much more likely than districts as a whole to not be integrating at all. In addition, districts under 5,000 ada appear to be less likely to be integrating at the full scope as defined by the Council. Finally, districts under 10,000 ada responded that insufficient financial resources have hampered their efforts to integrate. These findings suggest that smaller school districts may have special concerns with integration.

Made to: State Board of Education

"...unless time is given to the campus faculty to plan and understand the integration process, the plans will be very slow in moving to implementation."
– Small school district

5. **Develop mechanisms to allow teachers time and compensation to collaborate on integration planning and activities during the school year and summer months.**

Rationale:
"Insufficient release and preparation time for teachers" was cited most often by school districts as a barrier to their efforts to integrate. Since teachers are at the core of this reform movement, they must be provided with time for joint planning, coordinating and teaching of courses. The state cannot rely on the

good will of dedicated teachers if it expects to expand an integrated education system throughout the state. Funds must be directed toward compensating teachers for the new teaching arrangements required for successful integration.

Made to: State Board of Education
Local School Boards

6. **Allow flexible scheduling of courses to enable academic and vocational teachers to implement innovative integration practices.**

Rationale:
Some of the most innovative methods of integrating academic and vocational education are not bound by the traditional structure of courses, academic departments or daily school schedules. For example, fused courses and block scheduling enable both academic and vocational competencies to be taught within the same two-to-three-hour period of time. As long as students gain the appropriate competencies, how the instruction is delivered should be viewed broadly. Policies should be reviewed and revised to facilitate such innovative integration practices.

Made to: State Board of Education
Local School Boards

7. **Coordinate funding mechanisms at the federal, state and local levels so that resources outside of vocational education contribute to the process of integrating academic and vocational education.**

Rationale:
Smaller school districts (under 10,000 ada) which represent over 40% of the total student enrollment in Texas, cited "insufficient financial resources" as one of their biggest obstacles to integration. Those districts generally do not receive as much Perkins funding as larger districts, because funding levels are based partially on total enrollment, as well as Chapter One funds received. Districts that do not qualify for at least $15,000 in funding, furthermore, must enter into a consortium to receive funds. Although the primary financial impetus to integrate is coming from the vocational side of the equation under the

"A stronger push from the state level across all academic areas is needed to move integration of academic and vocational courses more quickly."
– Large school district

Perkins Act, integration also benefits college-bound students. Since integration is an educational restructuring in which academics are integrally involved, efforts should be made as much as possible to pool resources, both vocational and academic, at all government levels. For example, TCOVE has developed and sent to Congress a position statement regarding reauthorization of the Elementary and Secondary Education Act (ESEA) recommending that federal funds under the Act be used for integration. (See Appendix C for TCOVE statement.)

Made to: State Board of Education
Local School Boards

8. **Involve academic teachers and administrators, and counselors, as well as vocational staff, in technical assistance workshops and conferences on integration.**

Rationale:
Forty-four percent of districts cited resistance from academic teachers as an obstacle to their integration efforts. In addition, the largest school districts (over 50,000 ada) reported lack of consistent support from administrators to be a problem. Since true integration cannot be accomplished without the participation and cooperation of academic, as well as vocational, teachers and administrators, they must be included in conferences which describe the benefits of integrating, as well as technical assistance workshops on how to integrate. The State should take the lead in reducing the segregation of academic and vocational teachers and fostering their collaboration by offering joint programs for both groups.

Made to: State Board of Education

9. **Define the outcomes expected of integrated academic and vocational education and develop performance measures to evaluate the success of integration efforts.**

Rationale:
The integration of academic and vocational education can accomplish a number of objectives, from increasing students' engagement in school to preparing students for the work force to reducing segregation of students into tracks. The impact of integrating academic and vocational education cannot be evalu-

"The encouragement activities are coming mostly from career and technology education. The academic community needs to get on the 'bandwagon.'"
– Large school district

ated without first identifying the State's expected outcomes. Performance measures should be used to show whether integration is meeting the State's intended goals.

Made to: State Board of Education

10. Examine teacher training policies and programs in institutions of higher education to make future generations of teachers more receptive to applied and interdisciplinary instructional methods.

Rationale:
Integration of academic and vocational education is a long-term process for restructuring education. Changing how teachers are initially trained to deliver instruction can be a cost-effective way to implement integration in the future. It can reduce the need for the state to provide in-service training for practicing teachers. Training new teachers in integrated and experiential methods can also help to overcome resistance of academic teachers in the future.

Made to: Texas Higher Education Coordinating Board
Colleges and Universities

"I think this is an idea that will sell itself as students and teachers begin to feel more successful."
– Large school district

Endnotes

[1] W. Norton Grubb, Gary Davis, Jeannie Lum, Jane Plihal and Carol Morgaine, "'The Cunning Hand, the Cultured Mind': Models for Integrating Vocational and Academic Education," (Berkeley, CA: National Center for Research in Vocational Education, July 1991), p. 5.

[2] Ibid., p. 89.

[3] Colorado Statewide Integration Task Force, "Integration of Academic and Vocational Education: A Partnership with Educational Restructuring", (Denver, CO: Colorado Community College and Occupational Educational System, August 1991), p. 3.

Appendix A

INTEGRATION OF ACADEMIC AND VOCATIONAL EDUCATION
Survey of Texas Secondary Vocational Administrators

Please return by:
TUES., MAY 4

1. **What is the size of your school district?**

   School District (Overall ADA)

   _____ 50,000 +
   _____ 25,000-49,999
   _____ 10,000-24,999
   _____ 5,000-9,999
   _____ 1,000-4,999
   _____ under 1,000

2. **How many school campuses are there in your district?**
   Number of high schools _____ Number of middle schools _____

3. **What are the vocational program areas offered in your district?**

Industrial Technology	_____	Vocational Office Education	_____
Home Economics	_____	Health Occupations	_____
Trade & Industrial	_____	Other: _____	
Agricultural Science	_____	_____	_____
Marketing	_____		

PART ONE: DESCRIPTION OF INTEGRATION EFFORTS

4. **What steps has your school district taken in the last two years (1991-1993) to integrate academic and vocational education? (Check all that apply below.)**

   _____ None. (If none, skip to question #18)
   _____ Remedial education, learning labs, or tutoring in basic skills for vocational students.
   _____ Efforts to incorporate and apply academic competencies in vocational courses.
   _____ Efforts to revise academic courses to explain abstract concepts by applying them to real-life and occupational situations.
   _____ Utilization of Applied Academics curricula---vendor-developed.
   _____ Utilization of Applied Academics curricula---vendor-developed but modified locally.
   _____ Utilization of Applied Academics curricula---locally developed.
   _____ Development of career introduction or exploration courses.
   _____ Teaching a common theme (e.g., ecology/conservation, employability skills, etc.) in vocational and academic courses for a specified period of time.
   _____ Coordinating the teaching of academic and vocational courses so that subject matter is reinforced in both types of courses.
   _____ Recommended programs of study with sequences of both academic and vocational courses related to particular careers or occupational clusters.
   _____ Other, please describe:_____
   _____

5. **How are teachers involved in your school district's efforts to integrate academic and vocational education? (Check all that apply.)**

_____ Vocational teachers work independently.
_____ Academic teachers work independently.
_____ Vocational and academic teachers work together to coordinate course content.
_____ Vocational and academic teachers work together to develop courses or instructional materials.
_____ Vocational and academic teachers collaborate in the teaching of courses. (Team teaching)

6. **Which courses are involved in your district's integration efforts? (Check all that apply.)**

Industrial Technology	_____	English/Language Arts	_____
Home Economics	_____	Mathematics	_____
Trade & Industrial	_____	Science	_____
Agriculture	_____	Social Studies	_____
Marketing	_____	Other, please indicate:	_____
Office	_____		_____
Health Occupations	_____		

7. **How many school campuses are participating in your integration efforts?**
Number of high schools _____ Number of middle schools _____

8. **Have you targeted any particular group of students in your efforts to integrate vocational and academic education?** _____ Yes _____ No

If yes, what groups of students have you targeted?

_____ Students enrolled in vocational programs
_____ Students enrolled in general education courses
_____ All academically-deficient students
_____ Potential dropouts
_____ Handicapped students
_____ Limited English-speaking students
_____ All students
_____ Other, please describe: _____

9. **Have you applied to the Texas Education Agency (TEA) for any federal Perkins Vocational and Applied Technology Education funds during the period from 1991-1993?** _____ Yes _____ No

If no, why not?

If yes, how are you using your Perkins funds for your integration efforts? (Check all that apply.)

_____ Staff development/training for teachers
_____ Release time for teachers
_____ Reduction of class sizes
_____ Purchase of prepared curriculum materials
_____ Modification of existing curriculum materials
_____ Development of new instructional materials or curriculum
_____ Support of local curriculum coordinators or developers, responsible for integration
_____ Development of new and more sophisticated vocational programs (please describe): _____
_____
_____ Purchase of computers, software, or curricula for learning labs or other remedial programs
_____ Purchase of occupationally-relevant equipment
_____ Additional career counselors or guidance activities
_____ Other, please describe: _____ _____

Please include a copy of the Program Description (Schedule 4B) from your Perkins application, showing how you plan to integrate academic and vocational education.

10. What are your major objectives for this integration effort? (Check all that apply. Circle the <u>most important</u> objective.)

_____ Improve basic academic skills of vocational students
_____ Improve teaching methods for academic courses
_____ Permit vocational students to receive academic credit for vocational coursework
_____ Permit students to receive dual credit for new integrated academic/vocational courses
_____ Improve students' thinking and problem-solving skills
_____ Increase attention and motivation of students for learning
_____ Improve students' preparation for the work force
_____ Better prepare students for district- or state-level competency tests
_____ Satisfy federal funding requirements
_____ Improve students' awareness and knowledge of career choices
_____ Reduce dropout rates/increase daily attendance rates
_____ Increase enrollment in related postsecondary programs
_____ Reduce the segregation of students into vocational and academic "tracks"
_____ Improve teacher morale/generate increased enthusiasm in teaching
_____ Other, please list: _____
_____

PART TWO: BARRIERS AND INCENTIVES TO INTEGRATION

11. Thus far, what has been the general reaction of the following groups to your efforts to integrate academic and vocational education?

	strongly supportive	somewhat supportive	neutral	somewhat opposed	strongly opposed
vocational instructors					
academic instructors					
vocational administrators					
academic administrators					
principals					
state vocational staff					
state academic staff					
vocational students					
other students					
parents					
business community					

12. **In your efforts to integrate academic and vocational education so far, have district-level policies or practices supported or hindered your efforts?**

_____ Strongly supported (with money, time or other incentives)
_____ Moderately supported
_____ Neutral--neither supported nor hindered
_____ Moderately hindered
_____ Strongly hindered

Please describe how district policies have affected your efforts.

13. **In your efforts to integrate academic and vocational education so far, have state-level policies or practices supported or hindered your efforts?**

_____ Strongly supported (with money, time or other incentives)
_____ Moderately supported
_____ Neutral--neither supported nor hindered
_____ Moderately hindered
_____ Strongly hindered

14. **Of the following state policies or practices, which have been helpful to your integration efforts, and which have tended to discourage those efforts?**

	Encourage	Discourage	No Effect	N/A
State sponsorship of Applied Academics curricula	____	____	____	____
State development of other integrated curricula	____	____	____	____
Workshops/technical assistance about integration	____	____	____	____
In-service activities/training for teachers	____	____	____	____
Pilot projects	____	____	____	____
Other funding	____	____	____	____
New equipment for integration effort	____	____	____	____
Competency-based testing requirements	____	____	____	____
"Core" curriculum requirements for all students	____	____	____	____
Competency-based course content or objectives	____	____	____	____
Site-based management or decentralization of administration	____	____	____	____
State graduation requirements	____	____	____	____
Teacher certification requirements	____	____	____	____
Course approval process	____	____	____	____
State model curriculum standards for vocational courses	____	____	____	____
State definition or conception of vocational education, please describe: _____	____	____	____	____
Other, please describe: _____	____	____	____	____

15. **Which of the policies or practices listed in question 14 (or other initiatives) that are not currently established by the state would you find helpful for your integration efforts?**

16. **In developing or attempting to develop an integrated plan in your district, what do you perceive as the biggest obstacles? (Check all that apply. Circle the <u>biggest</u> obstacle.)**

_____ Insufficient financial resources
_____ Not enough release and preparation time for teachers
_____ Lack of expertise/Need for training for teachers and/or administrators
_____ Lack of vision, commitment and leadership
_____ Lack of consistent support from administrators
_____ Lack of understanding/knowledge of the concept of integration
_____ Resistance from academic teachers
_____ Resistance from vocational teachers
_____ Unavailability of integrated materials
_____ Constraints of state graduation requirements
_____ Other, please list: _____
_____
_____

PART THREE: EVALUATION/ASSESSMENT

17. **What indicators or measures do you plan to use to judge the success or failure of your integration efforts? (Check all that apply.)**

_____ Increased graduation rate
_____ Higher test scores on district tests
_____ Higher test scores on state-level tests
_____ Lower absenteeism
_____ Higher student interest and participation in classes
_____ Improvement in students' thinking and problem-solving skills
_____ Teacher satisfaction that curriculum changes are improving instruction
_____ Parent satisfaction that changes are improving instruction
_____ Fewer "general math" or "general science" classes
_____ Feedback from employers that students have better skills
_____ Increased attendance in postsecondary education
_____ Pre- and post- student attitude surveys regarding academic & vocational subjects
_____ Other: _____
_____

18. **If you have not attempted to integrate academic and vocational education, why not?**

19. **If you are not currently integrating academic and vocational education, will you be looking at developing a process within the next three years?**

_____ Yes _____ No

If no, why not?

If yes, what initiatives to integrate academic and vocational education are you planning?

_____ Remedial education, learning labs, or tutoring in basic skills for vocational students.
_____ Efforts to incorporate and apply academic competencies in vocational courses.
_____ Efforts to revise academic courses to explain abstract concepts by applying them to real-life and occupational situations.
_____ Utilization of Applied Academics curricula---vendor-developed.
_____ Utilization of Applied Academics curricula---vendor-developed but modified locally.
_____ Utilization of Applied Academics curricula---locally developed.
_____ Development of career introduction or exploration courses.
_____ Teaching a common theme (e.g., ecology/conservation, employability skills, etc.) in vocational and academic courses for a specified period of time.
_____ Coordinating the teaching of academic and vocational courses so that subject matter is reinforced in both types of courses.
_____ Recommended programs of study with sequences of both academic and vocational courses related to particular careers or occupational clusters.
_____ Other, please describe:_____
_____
_____

20. **Additional comments. (Please feel free to add any information you think may be helpful, such as describing how integration is working in your district or giving recommendations about what is most needed in order to integrate.)**

Thank you for your time and consideration. If you would be willing to engage in further discussion concerning these issues or would like a copy of the study results, please complete the information below.

Name: _____
School: _____
Address: _____
Phone: _____

Reminder: Please include a copy of the Program Description (Schedule 4B) of your application to TEA (Standard Application System) for Perkins Vocational and Applied Technology Education Funding.

Please return to:

Texas Council on
Vocational Education
P.O. Box 1886
Austin, TX 78767

Appendix B

Incorporating Integration of Academic & Vocational Education into the Elementary and Secondary Education Act

A Position of the State Councils on Vocational Education in Florida, New York and Texas
April 1993

Integration Established as Goal in Perkins Act

The latest reauthorization of the Carl Perkins Vocational and Applied Technology Act emphasizes the need to better prepare today's students to compete in a technologically advanced, global work force by developing more fully both their occupational and academic skills. Congress determined that one way this goal could be accomplished is by focusing funds on improving education programs through the integration of vocational and academic curriculum.

Integration involves changing both the vocational *and academic* courses and then coordinating them in a cohesive program. Vocational and academic instructors work together to: 1) teach fundamental academic concepts initially in academic courses in an applied way that shows the value of learning to students; and 2) apply and reinforce academic competencies in vocational courses.

Coordination of Perkins Act with ESEA

In order for the integration of academic and vocational education to be fully effective, it must receive the same priority status on the academic side of the equation as in vocational education. Congress can reinforce its commitment to the integration of academic and vocational education as an effective pedagogical strategy, particularly for special populations, by coordinating its intent in the Perkins Act with the Elementary and Secondary Education Act.

In particular, the following elements required for effective integration should be addressed in the Elementary and Secondary Education Act (ESEA) amendments.

- The importance of the integration of academic and vocational education should be acknowledged in the ESEA, both with explicit statements and eligibility for funding. This action would legitimize the integration of academic and vocational education outside the Perkins Act.

- Teachers and administrators must be at the core of this reform movement. Incentives should be provided to encourage academic and vocational teachers and administrators to participate in integration efforts. Attendance at conferences with model program demonstrations can show them the value and effectiveness of teaching academic concepts in an applied and experiential manner. Participation at these conferences will also provide them with actual activities they can apply in their own schools and districts. Compensation for their time in collaborating with vocational teachers on integration projects is also needed.

- Training/staff development is required to develop the expertise to effectively integrate academic and vocational competencies. Purchasing applied curriculum does not solve the concerns surrounding the integration of academic and vocational education.

- One of the goals of integrating academic and vocational education as stated in the Perkins Act is to ensure that students "achieve both academic and occupational competencies." Most academic teachers are not accustomed to identifying competencies. Resources and technical assistance are needed to help identify those academic competencies.

- An essential component of an effective integration program is a consolidated career guidance system, beginning at the elementary level and continuing through high school. Youth must be made aware of the range of careers and the specific occupations available to them. They also need to understand the importance of schooling to their future, whether they plan to go into the work force after high school or go to college.

- Teachers and administrators are indicating tremendous success with efforts to articulate programs from secondary to postsecondary levels through occupational education courses. These programs under the title of Tech-Prep are a natural pathway to move the occupational educators into contact with their academic counterparts. Consideration should be given in the ESEA reauthorization to provide resources to make that pathway effectively include the academic teachers.

Specific Recommendations for Incorporating Integration into ESEA:

1. Give priority for the use of Chapter 1 funds and Local Targeted Assistance Program funds to programs that teach academics in an applied and experiential manner and integrate academic and vocational courses.

   The American Vocational Association (AVA) has proposed language to this effect to be incorporated throughout the Act: under the Basic Program Requirements (Section 1011), for Schoolwide Projects (Sec. 1015), for Basic Skills Improvement and Dropout Prevention programs (Section 1103), for programs for handicapped children (Section 1223) and for Local Targeted Assistance programs (Section 1531).

2. Specify that Chapter 1 funds (Sec. 1011, (a) (2)) and Local Targeted Assistance Program funds (Section 1531) may be used for:

   - technical assistance and training for applied teaching methods and the integration of academic and vocational competencies;
   - release time or stipends to enable academic and occupational teachers to work together to develop curriculum and instructional materials and/or coordinate courses to integrate academic and vocational education;
   - travel and fees for academic and vocational teachers and administrators to attend conferences and workshops on the integration of academic and vocational education and observe innovative pilot projects.

3. Under Chapter 2, Part B—National Programs and Activities, establish a national program of contracts and grants to assist States in identifying academic competencies which are career-oriented and relate directly to the workplace.

4. Specify that Chapter 1 Basic Program funds (Sec. 1011), Schoolwide Projects funds (Sec. 1015), Basic Skills Improvement Programs funds (sec. 1103), and Local Targeted Assistance Programs funds (Sec. 1531) may be used for career guidance and counseling activities or projects which make students aware of the connection of academics to the world of work, including career introduction and exploration courses.

Paul Cole	Ann Hodge	G. Herb Sheheane
Chair	Chair	Chair
New York COVE	Texas COVE	Florida COVE

Appendix C

EDTC PILOT SITES

Initial Pilot Sites (Beginning in 1991-92)

Austin I.S.D.
1111 W. 6th Street
Austin, TX 78703-5399
(512) 499-1701, 4490#

Contact Person: Margaret Lindsey
Admin. Supv., School to Work Program

Greenville I.S.D.
P.O. Box 1022
Greenville, TX 75403
(903) 457-2530

Contact Person: Mike Cardwell,
Asst. Supt. of Instruction

Mansfield I.S.D.
605 East Broad Street
Mansfield, TX 76063
(817) 473-5682

Contact Person: Jerry Knight,
Vocational Director

Socorro I.S.D.
12300 Eastlake Dr.
El Paso, TX 79927
(925) 858-0912

Contact Person: Carl Cooper
Vocational Director

Additional Pilot Sites (Beginning in 1992-93)

Abilene I.S.D.
Abilene Cooper High School
3639 Sayles Street
Abilene, TX 79605
(915) 691-1000

Contact Person: Ronnie McQueen
Special Pops Coordinator

Boles I.S.D.
Route 3, Box 48
Quinlan, TX 75474-9760
(903) 893-2161

Contact Person: Graham Sweeney
Superintendent

Cooper I.S.D.
P.O. Box 478
Cooper, TX 75432
(903) 395-2112

Contact Person: Fred Wilkerson
Superintendent

Cumby I.S.D.
Route 2, Box 25H
Cumby, TX 75433
(903) 994-2261

Contact Person: Ronnie Stanley
Superintendent

Pampa I.S.D.
111 East Harvester
Pampa, TX 79065
(806) 669-4800

Contact Person: Daniel Coward
Principal

Committee Members:
Raul Ramirez
Lillian J. Suchoff
Theodore A. Talbot

Project Coordinator:
Anne M. Dorsey

Texas Council on Vocational Education
P.O. Box 1886
Austin, Texas 78767

(512) 463-5490